

6 May 1966

TO: Harry C.

SUBJECT: Report of Conference at ADP 22-23 March 66
Thermal Improvements

OSA -1699-66

REFERENCE: 1) ADP letter to [redacted] 25X1A
2) [redacted] report to Ed M. 3/29/66 (copy enclosed)

25X1A

Dear Harry:

A review of the referenced reports suggests a recapitulation of the status of events since the conferences held at ADP.

For clarification purposes, reference 1) and 2) above are, for all intents and purposes identical, hence comments made apply to both.

1. Visor (Pressure Faceplate)

* Ref. Para (3). "Discussions have been held between we and the Perkin-Elmer Corporation on the feasibility of coating the present pressure face plates. They concede that applying anti-reflectance coatings to the inside surface of this visor with the existing thin plastic film which protects the gold conductive film would have to be on an exploratory basis with low level of confidence of success. An estimated cost for this exploratory work would be in the area of \$10,000. Some problems will exist due to the concern for processes which the present visor coater, Sierracin Corporation, now claims as proprietary to them."

Ref. Para (4). There are at present in the inventory, five (5) PPG visors which can be used on the standard ACS-880N helmets. Mountings for using the PPG visor on the Phase II type helmet with the mask or the helmets with face barriers using the larger Phase II type shell have not been generated. These visors have the double-layered coating on both the outside and inside surface. These visors also have the highest known visible light transmission due to the fact the wires are used for heating instead of the gold conductive film. These visors would be best from the standpoints of normal operations, especially night operations.

Disposition of these visors is:

One (1) at area being used in flight evaluations.

Three (3) shipped to PSO and receipt acknowledged by PSO but as of last report not delivered to area.

One (1) at Edwards AFB being used in flight evaluations. In addition to the above visors, One (1) additional visor is still due from PPG on contract DC-1503. This visor was rejected

due to the edge attachment being out of tolerance and was returned for rework. It is expected to be returned by mid April, 66.

On contract DC-1506, we still have several visors due with three-layered coatings inside and out. Optical Coating Labs expects to complete coating of three sets of blanks within the new few weeks. One blank of the four sets was destroyed in development.

PPG also still hopes to deliver a visor with their three-layered coating. They have completed the flat samples of glass with three layers and should be proceeding with the visor soon.

Ref. Para. (5). All the face plates at OCL are PPG glass visors.

2. Auxiliary Shields (Sun Shields - Infra-Red Reflective)

Ref. para. (2).^{*} The Gemini helmet has been fitted with only one (1) auxiliary visor. This was for solar radiation protection. References to the multiple auxiliary shield must be corrected to read Apollo Block II Space Suit Assemblies.

The mountings developed for the Gemini and Apollo programs are not relative to this program because the helmet configurations are entirely different. The Apollo program uses a dome enclosure which does not provide for movable pressure face plates or interrelating oxygen systems, etc.

These comments should not be construed to mean that multiple auxiliary shields are not feasible. It does mean engineering work will be required specifically for the model helmets we use.

The loan of a sample Apollo helmet is not possible, even quite irrelevant.

Other Suit Considerations:

Ref. Second Para. Page 5. There appears to be a tendency, perhaps naturally at this point in the program, to place virtually all the emphasis on the relatively normal conditions being experienced in the cockpit environment. Only occasionally has there been some analysis of what the conditions might be expected to be with total failure of the environmental control system which would place the pilot in an environment on the mission profile representing lowest absolute altitude and hottest conditions for some period of time which has not yet been defined.

It is our considered opinion that the entire atmospheric

pressure range from the normal to the emergency should be included in the thermal analysis. We will check the selected materials at the normal cabin altitude under comparative conditions so that there will be less likelihood for disagreement as indicated in this referenced paragraph./*/*/*

3. Current Directed Effort Per Hqtrs MSG 7178

- 3.1 Procure and process four (4) clear sunshades (Auxiliary Shields) for anti-reflectance on the inside and infrared on the outside.
- 3.2 Modify one (1) existing flight-worthy helmet to provide 200 LPM constant capability flow at 35,000 and install two exhalation valves. With reference to the interchangeability of visors, there will be a need for an adapter when visors would be shifted from standard size shell to Phase II type larger shell. This should present no problem.
- 3.3 Provide additional insulation for PPA hot spots for subjects 1045, 1050, 1051 and Bill Park.

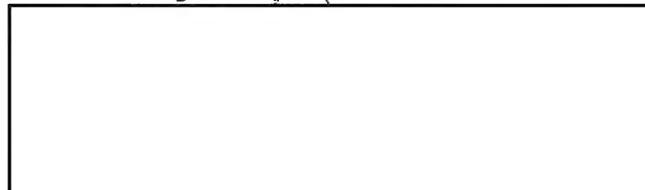
4. Consideration for Additional Effort

Based on the referenced conference reports, the additional effort necessary to provide the auxiliary shield for solar radiation is warranted since there are conditions under which pilots have use for the present helmet sun shades. This, however, is a longer term effort and would require fairly comprehensive helmet hardware design effort.

Effort on this item will not be started unless Hqtrs. so directs.

We invite your comments or corrections, if necessary.

Regards,



25X1A

JAR:sc